

ture and disposition of the bony canals for the vertebral arteries which are peculiarly characteristic of the Camelidæ among existing Mammalia. In Plate VI. fig. 2, the groove and orifices of the canal for the vertebral artery are shown in a section exposing the spinal canal: in Plate VII. figures 1 and 3 exhibit the orifices at the commencement of the arterial canals, as seen in a posterior view of the vertebræ; in figs. 2 and 4, the terminations of the same canals are shown, in the anterior view of the same vertebræ; the smaller figures (3 and 4) are taken from the fourth cervical vertebra of a Llama. The vertebræ of the *Macrauchenia* also closely resemble the middle cervical vertebræ of the *Vicugna* and *Llama* in their elongated form; approaching the Auchenian division of the Camelidæ, and deviating from the true Camels in the relations of the length of the body of the vertebra to its breadth and depth, and in the much smaller size of the inferior processes. Excepting the Giraffe, there is no existing mammal which possesses cervical vertebræ so long as the *Macrauchenia*; but the cervical vertebræ of the Giraffe, differ in the situation of the perforations for the vertebral arteries, and in the form of the terminal articular surfaces, as will be presently noticed.

Both of the cervical vertebræ of the *Macrauchenia* here described, are of the same size, each measures six inches and a half in extreme length, two inches, ten lines in breadth, and two inches, four lines in depth. In the Giraffe and the Camelidæ, the spinous processes are thin laminæ of considerable extent in the axis of the vertebra, but rising to a very short distance above the level of the vertebral arch: the spinous processes have the same form in the corresponding vertebræ of the *Macrauchenia*, but present a still greater longitudinal extent; they commence at the interspace of the anterior oblique processes, and extend to opposite the base of the posterior oblique processes; the upper margin describing a gentle curve, as shown in fig. 1, Pl. VI. The transverse processes also present the form of slightly produced, but longitudinally extended, laminæ: their disposition is essentially the same as in the Camelidæ, but more nearly corresponds with the modifications presented by the Auchenianæ. The inferior transverse processes,—those which are alone developed in fish, but which are not present in any other vertebræ save the cervical, in mammalia,—these processes in the *Macrauchenia* are continued from the sides of the under surface of the anterior part of the body of the vertebra; their extremities being broken off, it cannot be determined how far they extended from the body of the vertebræ, but they gradually subside as they pass backwards: the superior transverse processes are continued outwards from the sides of the posterior part of the body of the vertebra, and gradually subside as they advance forwards along three-fourths of the body of the vertebra: they are not continued into the anterior and inferior transverse processes, as in the *Vicugna*, but are separated therefrom by a narrow and shallow groove. The articular, or oblique processes, closely resemble those of the Auchenianæ

in form, and in the direction of the articular surfaces; those of the anterior processes looking inwards and a little upwards; those of the posterior, outwards and a little downwards.

In the *Macrauchenia* a small longitudinal process (*c*, fig. 2, Pl. VII.) is given off immediately below the base of the anterior oblique process; this structure is not observable in any of the cervical vertebræ of the Giraffe or Camelidæ.

In the form of the articulating surfaces of the bodies of the vertebræ the *Macrauchenia* deviates from the Giraffe and Camel, but resembles the Auchenianæ. In the Giraffe and Camel the anterior articulating surface is convex and almost hemispheric, the posterior surface is proportionally concave, so that the cervical vertebræ are articulated by ball and socket joints; yet not, as in most Reptiles, with intervening synovial cavities, but by the concentric ligamentous intervertebral substance characteristic of the Mammiferous class. In the Llama and *Vicugna*, the degree of convexity and concavity in the articular surface of the bodies of the cervical vertebræ is much less than in the Camels; and in consequence they carry their necks more stiffly and more in a straight line. In *Macrauchenia* the anterior articulating surface (fig. 2, Pl. VII.) presents a still slighter convexity than in the Llama (fig. 4, Pl. VII.), and the posterior surface (fig. 1, Pl. VII.) presents a correspondingly shallower concavity. The form of the extremities of the body of the vertebræ, especially of the posterior, is sub-hexagonal, the breadth being to the depth as eight to five. The sides and under part of the vertebræ are slightly concave; on the inferior surface there are two ridges, continued forwards from the posterior margin of the vertebra, each situated about an inch distant from the middle line; they converge as they pass forwards, and are gradually lost in the level of the vertebra; their greatest elevation does not exceed half an inch. In the Auchenianæ there is a longitudinal protuberance in the mesial line, instead of the two ridges. The two long cervical vertebræ of the *Macrauchenia* are also characterized by the maintenance of an almost uniform diameter of the body, both in its vertical and transverse extent; the cervical vertebræ of the *Vicugna* come nearest to them in this respect; those of the Camel deviate further in the large excavation at the under part of the body.

The long vertebral or spinal canal offers a slight enlargement at the two extremities; this structure which is generally in the ratio of the extent of motion of the vertebræ on each other is more marked in the Camel, where the form and mode of articulation of the bodies of the vertebræ are designed to admit of a free and extensive inflection of the cervical vertebræ; and the result of this structure is very obvious in the sigmoid flexure of the neck in the living animal. In the Auchenianæ, on the contrary, the neck is carried less gracefully erect and in an almost straight line, and the form of the vertebræ and the nature of their joints correspond, as we have seen, to this condition. From the length of the bodies of the